CHAPTER 1.11 – WET Testing of Minor Municipal (< 1.0 MGD) Discharges

This chapter provides a streamlined procedure for determining whether the WET Checklist should be completed for a minor municipal discharge.

NOTICE: This chapter is intended solely as guidance, and does not contain any mandatory requirements except where requirements found in statute or administrative rule are referenced. This guidance does not establish or affect legal rights or obligations, and is not finally determinative of any of the issues addressed. This guidance does not create any rights enforceable by any party in litigation with the State of Wisconsin or the Department of Natural Resources. Any regulatory decisions made by the Department of Natural Resources in any matter addressed by this guidance will be made by applying the governing statutes and administrative rules to the relevant facts.

Historical Data from Minor Municipal Discharges

Past whole effluent toxicity (WET) guidance (i.e., the "*Minor Municipal Strategy*", April 1991), recommended that dischargers of municipal wastewater that had effluent design flows less than 0.250 million gallons per day (MGD) be exempted from performing WET tests for WPDES compliance. The 1991 Minor Municipal Strategy was written in the early stages of the WET program when little toxics and WET data was available on different types of discharges. This cutoff was chosen because facilities ≥ 0.250 MGD comprised approximately 30% of minor municipal facilities. It was decided that this upper one-third of minor municipal dischargers (those ≥ 0.250 MGD) would be tested first during a "trial period" to determine whether WET was a concern at minor municipal facilities. The decision to limit the number of minor municipalities to be tested was based solely on workload considerations and not on scientific information, WET data, or any type of judgment that these discharges were not toxic.

Five years later in 1996, when the WET Guidance Document was first created, the Biomonitoring Team reviewed available WET data for all municipal facilities, including those dischargers just above and below the 0.250 MGD cutoff. Table 1.11 below summarizes WET data collected from 1992-2001 from municipal dischargers. This and other data showed that effluent flow volume does not influence a facility's potential for toxicity. Instead, factors such as industrial contribution, available dilution, treatment efficiency, additive use, etc. was found to play a much more important role in a facility's toxicity potential.

Table 1.11 WET Data from Municipal Dischargers (data from 01/01/1992 - 10/31/2001)

Design Flow (MGD)	Acute			Chronic		
	# Tests done	# failed	**% failed**	# Tests done	# failed	**% failed**
≤ 0.25	136	33*****	**24.3%**	75	21*****	**28.0%**
> 0.25 & ≤ 0.50	227	23	10.0%	125	24	19.2%
> 0.50 & ≤ 1.00	221	14	6.3%	184	54	29.3%
> 1.00 & ≤ 5.00	483	44	9.0%	370	78	21.1%
> 5.00	246	38	15.0%	156	17	10.9%
TOTAL	**1,313**	**152**	**11.6%**	**910**	**194**	**21.3%**

Total tests conducted by municipals: 2,223 (poor QA, TIEs, and inconclusive tests not included)

***** Ammonia may be the cause of toxicity in 16/33 of the acute and 11/21 of the chronic tests done by minor municipal dischargers with a design flow ≤ 0.250 MGD. This is based on a very generalized assumption about this data - the fathead minnow was the most sensitive species in these tests, which usually suggests that ammonia is at fault because fish are more sensitive to ammonia than invertebrates. When these "ammonia failures" are removed from the above dataset, munis ≤ 0.250 MGD failed 19/119 (13.4%) of acute tests and 10/64 (15.6%) of chronic tests.

The Whole Effluent Toxicity (WET) Checklist

To help staff make WET limit and monitoring decisions, the "WET Checklist" was created along with the WET Guidance Document in 1996, using factors such as industrial contribution, available dilution, treatment efficiency, additive use, etc., to assess a facility's toxicity potential. Effluent design flow is not considered (except as a factor in determining available dilution), since WET data shows that facility size alone does not play a role in a facility's toxicity potential. The Checklist was designed to assist staff when assigning WET limits and WET monitoring to individual discharges, based on their potential to exhibit toxicity or exceed water quality standards. As the potential for toxicity increases, more points accumulate and more monitoring is recommended to insure that toxicity is not occurring (see WET Checklist discussion in Chapter 1.3 for details).

The Biomonitoring Team said in 1996 that they believed the WET Checklist to be more scientific and defensible because it is a logical process by which facilities may be exempted from WET monitoring (if toxicity potential is low enough) and not just an arbitrary cutoff. At that time, the team asked permits staff whether the removal of this 0.250 MGD cutoff would be problematic. Staff replied that workload concerns exist in some cases which might make removal of this cutoff a problem. For example, at that time little was known about how much time and effort would be involved in completing the WET Checklist, it wasn't clear who (basin engineer, permit coordinator, WQBEL staff) would be completing the WET Checklist and how this would impact each person's workload, and staff were concerned that $Q_{7,10}$ and receiving water data may be hard to come by for some facilities. Due to these concerns, the WET Guidance Document was written in 1996 to allow staff to exempt municipal facilities <0.250 MGD from the WET Checklist process, if they chose to do so based on workload concerns. The guidance also allowed staff to evaluate these facilities using the WET Checklist, in situations where workload was not a concern.

Prior to this guidance, as much as eleven years after it was decided to exempt municipal facilities < 0.250 MGD during a "trial period", and six years after the creation and original implementation of the WET Checklist, WQBEL staff in all DNR Regions are regularly completing the WET Checklist as a part of their overall WQBEL review. Due to guidance in Chapter 1.3 between 1996-2002, however, some regions evaluated minor municipalities < 0.250 using the WET Checklist and some were still exempting them from this process. In those regions where all dischargers were evaluated using the WET Checklist, staff reported that there was little time and effort involved in completing the WET Checklist for smaller, less-complex dischargers. These same staff also reported that $Q_{7,10}$ and receiving water information is available in most cases. However, staff in regions where the Checklist wasn't completed for facilities < 0.250 MGD, said that they were not doing so because of the same issues raised in 1996.

A Quick Check to Determine if the WET Checklist is Necessary

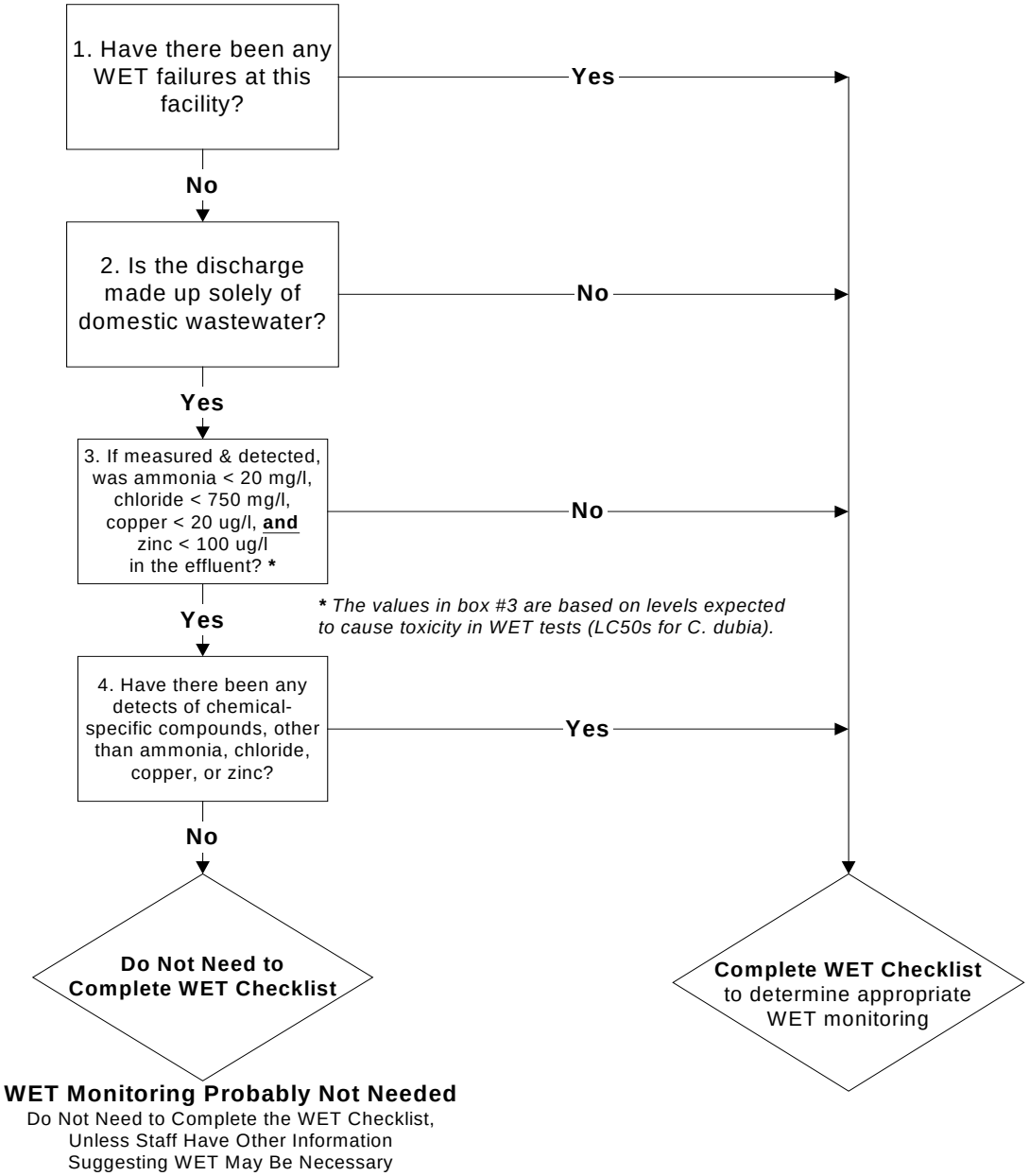
Based on data in Table 1.11, the Biomonitoring Team does not feel that exemptions for facilities (municipal or industrial) based solely on effluent flow volume are appropriate. Instead, facilities should be evaluated using a more logical process by which they may be exempted if factors of concern are absent and not just due to an arbitrary cutoff. The WET Checklist uses this type of logical process where more important factors such as available dilution, contributing industries, and additive use are considered when determining a facility's toxicity potential. However, the team realizes that all of the information needed to complete the WET Checklist may not be available in all cases.

Due to workload and data issues that are still a concern to some permits staff, a "quick check" process has been created which may be used to determine whether a more in-depth analysis via the WET Checklist is necessary to determine the need for WET testing at a minor municipal facility. By answering a few easy, Yes/No type questions, staff should be able to determine quickly whether further evaluation via the WET Checklist is necessary. The flowchart in Figure 1.11 contains questions about information that is normally evaluated as part of the WET Checklist process and which usually play the biggest part in determining a municipal facility's WET potential. ***(NOTE: If staff wish to skip this "quick check" and go directly to the more thorough review process using the WET Checklist, they may do so. The Biomonitoring Team believes that the Checklist is the best, most thorough process available for estimating a facility's toxicity potential.)***

In effect, the flowchart shown in Figure 1.11 leads the user through a shortened, cursory review of the information that is entered into the WET Checklist. The information needed to answer the questions in the flowchart is basic knowledge about the discharge which permit staff will already need to know in order to complete a permit reissuance or WQBEL

recommendation (i.e., no additional data or background work should be necessary; so there should be no significant workload impact). In most cases, if the situation is such that the answers to the questions in the flowchart end at the diamond-shaped box labeled "*Do Not Need to Complete the WET Checklist*", it is likely that a more complete review including the WET Checklist would not recommend WET monitoring for the facility. In other words, if a minor municipal facility has no WET failures, no industrial contributors, no detects of chemicals other than ammonia, chloride, copper, and zinc, and levels of these compounds are below that which would be expected to cause WET problems (<20 mg/l, <750 mg/l, 20 ug/l, and 100 ug/l, respectively), then WET testing may not be necessary, the WET Checklist process (including staff BPJ concerning final checklist recommendations) would most likely not recommend monitoring, and the WET Checklist does not need to be completed.

Figure 1.11 Flowchart to Determine Whether to Evaluate a Minor Municipal (<1.0 MGD) Using the WET Checklist



The flowchart given above may be used by WQBEL (or permits staff if a WQBEL review is not done) to quickly decide whether a minor municipal discharge should be evaluated via the WET Checklist. This flowchart may be applied to any minor municipal discharge < 1.0 MGD. However, because of permit application requirements (see page 9 of Chapter 1.3) and the complexity of their effluents, this "quick check" process cannot be used for major municipal (≥ 1.0

MGD) or industrial discharges. Major municipal and industrial discharges should be evaluated using the WET Checklist available in SWAMP (see WET Checklist discussion in Chapter 1.3 for more details).

NOTE: The WET Checklist (described in Chapter 1.3) and the "quick check" described in this chapter are both based on certain assumptions. One of these assumptions is that each discharge has been monitored for chemical-specific parameters, especially those substances with water quality criteria for the protection of fish and aquatic life in Tables 1 & 2 (acute) and Tables 3 & 4 (chronic), in ch. NR 105, Wis. Adm. Code. When data regarding the presence or absence of those parameters have not been collected for the effluent being evaluated, neither the WET Checklist nor this quick check can adequately determine the discharge's potential for toxicity. Users should be aware of these potential shortcomings in WET determinations, if data for these parameters are not available.

WET Reviews and WQBEL Recommendations

WQBEL staff should document in their WQBEL recommendations memo (or permits staff should document in the fact sheet or briefing memo if a WQBEL review is not done) that based on this preliminary review, the WET Checklist was not completed and WET testing is not recommended. For example, the following explanation would suffice:

> "*This is a minor municipal facility (< 1.0 MGD) which has no historical WET failures, no known industrial contributors, no detects of chemicals other than ammonia, chloride copper, and zinc, and these compounds are below that which would be expected to cause WET problems. Therefore, no further WET evaluations were deemed necessary (according to the Minor Municipal Strategy described in Chapter 1.11 of the WET Guidance Document) and WET testing is not recommended at this time.*"

If staff feel that there are other factors which may contribute to the potential for WET problems (for example, known ecological impacts, other special environmental conditions in the area of the discharge, or other information), the WET Checklist should be completed and WET monitoring and/or limits given based on it's recommendations and staff's best professional judgment. If any questions or problems arise, staff should contact the Biomonitoring Coordinator.